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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/537,584

Applicant(s)

DESTRO ET AL.

Examiner

ANCA EOOF

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-32 is/are pending in the application.
- 4a) Of the above claim(s) 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19, 20 and 22-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 19-32 are pending in the instant application with claim 21 withdrawn from consideration. Claims 1-18 are canceled.
2. The foreign priority document No. 0228647.4 filed on December 9, 2002 in the United Kingdom was received and acknowledged.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 30-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 30 recites the limitation "checking the color of the tag or sample". As the specification of the instant application does not define such step, it is not clear what is the applicant regarding as his invention.

Claim Rejections - 35 USC § 102 and 35 USC § 103

5. The following is a quotation of the appropriate paragraph of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 19-20, 22-30 and 32 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fujikawa et al. (US Patent 5,698,373).

With regard to claim 19, Fujikawa et al. disclose a photosensitive composition comprising a base resin (column 3, line 60), a dye precursor which forms a dye upon irradiation of actinic light (column 4, lines 16-17). The composition may also comprise antioxidants, such as 4,4'-thio-bis (3-methyl-6-tert-butylphenol) (column 6, line 35).

The base resin of Fujikawa et al. is equivalent to the polymeric material of the instant application, wherein the dye precursor is equivalent to the color former (b) of the instant application and 4,4'-thio-bis (3-methyl-6-tert-butylphenol) (column 6, line 35) is equivalent to the component (a) of the instant application, which is a compound comprising two hydroxyphenyl moieties, each carrying one bond to a linking group (-S-) and each carrying 2 alkyl substituents (methyl and tert-butyl groups).

The limitations where the polymer material is "in form of a fiber, textile, nonwoven or film", "it is contained on or visibly below the surface of a protective clothing, mask or irradiation indicating tag", and "said protective clothing, mask or irradiation indicating tag undergoes an irreversible change upon exposure to irradiation" are merely intended uses and add no patentable weight to the claim.

Therefore, the photosensitive composition of Fujikawa et al. is equivalent to the polymer material of the instant application or, in the alternative, the photosensitive composition of Fujikawa et al. renders obvious the polymer material of the instant application.

With regard to claim 20, the limitation of "the irradiation is of higher energy than visible light and is selected from ultraviolet light, X-ray, gamma radiation and particle radiation" is merely an intended use and adds no patentable weight to the composition of claim 19.

With regard to claims 22-23 Fujikawa et al. disclose 4,4'-thio-bis (3-methyl-6-tert-butylphenol) (column 6, line 35), which is equivalent to the compound (A) of the instant application, wherein $n=2$, R_1 is $-S-$, R_2 and R_3 are hydrogen atoms, R_4 is a methyl group and R_5 is a tert-butyl group (tertiary C_4 group).

With regard to claim 24, Fujikawa et al. further disclose that the dye precursors may be spiropyrans, fluorans or triarylmethane dyes (column 4, lines 16-28).

With regard to claim 25-27, Fujikawa et al. disclose that the antioxidant is preferably in the range of 1.0 to 20 parts by weight, preferably 2 to 10 parts by weight per 1 part by weight of the dye precursor (column 7, lines 4-6) and the dye precursor is present in an amount of 0.001 to 5 parts by weight relative to the whole photosensitive composition (column 4, lines 39-47).

With regard to claim 28, Fujikawa et al. disclose that the base resin may be a polyester, which is a transparent thermoplast as evidenced by Killey (US Patent 5,342,672) in column 11, lines 15-16.

With regard to claim 29, Fujikawa et al. disclose that the base resin may be polyamides or saturated polyesters (column 3, lines 60-61).

With regard to claim 30, Fujikawa et al. disclose a photosensitive composition comprising a base resin (column 3, line 60) and a dye precursor which forms a dye upon irradiation of actinic light (column 4, lines 16-17). The composition may also comprise antioxidants, such as 4,4'-thio-bis (3-methyl-6-tert-butylphenol) (column 6, line 35).

The base resin of Fujikawa et al. is equivalent to the polymeric material of the instant application, wherein the dye precursor is equivalent to the color former (b) of the instant application and 4,4'-thio-bis (3-methyl-6-tert-butylphenol) (column 6, line 35), which is equivalent to the component (a) of the instant application, which is a compound comprising two hydroxyphenyl moieties, each carrying one bond to a linking group (-S-) and each carrying 2 alkyl substituents (methyl and tert-butyl groups).

Fujikawa et al. further disclose that a photosensitive layer may be formed on a metallic plate or on a plastic film (column 4, lines 48-51), equivalent to the step of placing a sample of polymer material in site to be controlled of the instant application.

The exposure is then made through a negative film and an imaged area is colored or through a positive plate so there is formed a pattern in which a non-imaged area is colored while an image area is not colored (column 5, lines 1-5).

Fujikawa et al. further disclose that the color tone may be measured by a Macbeth densitometer (column 9, lines 27 and 42), which is equivalent to the step of checking the color of the instant application.

With regard to claim 32, the limitation of "the irradiation is from ultraviolet laser or ultraviolet lamp radiation of 285 to 400 nm, electron radiation, X-ray and gamma radiation" is merely an intended use and adds no patentable weight to the composition of claim 20.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 19-20 and 22-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashihara et al. (US Patent 5,824,715) in view of Greer, IV (US Pg-Pub 2002/0057881).

With regard to claim 19, Hayashihara et al. disclose a marking composition comprising an energy ray curing resin and a leuco dye (abstract), equivalent to the color former of the instant application. Hayashihara et al. further disclose that the composition may comprise an antioxidant (column 6, lines 19) but fails to disclose the type of antioxidant used in the marking composition.

Greer, IV discloses a radiation-curable coating composition comprising a dye or dye precursor (abstract), equivalent to the color former of the instant application, resins (oligomers A-E in table in par.0187) and antioxidants which minimize or even inhibit the

destruction of the dye and the coating (par.0131). Preferred antioxidants include derivatives of phenol, such as tetrakis (methylene 3-(3', 5'-di-t-butyl-4'-hydroxy-phenyl propionate) methane (par.0143).

Therefore, it would have been obvious to one of ordinary skill in the art at the time to include a phenolic antioxidant, such as tetrakis (methylene 3-(3', 5'-di-t-butyl-4'-hydroxy-phenyl propionate) methane as disclosed by Greer, IV in the marking composition of Hayashihara et al., in order to minimize or inhibit the destruction of the dye and the coating (Greer, IV, par. 0131).

The tetrakis (methylene 3-(3', 5'-di-t-butyl-4'-hydroxy-phenyl propionate) methane comprises four phenol moieties, each carrying one bond to a tetravalent alkyl group of 5 carbon atoms which is end-capped with -OCO- groups.

The limitations where the polymer material is "in form of a fiber, textile, nonwoven or film", "it is contained on or visibly below the surface of a protective clothing, mask or irradiation indicating tag", and "said protective clothing, mask or irradiation indicating tag undergoes an irreversible change upon exposure to irradiation" are merely intended uses and add no patentable weight to the claim.

Therefore, the photosensitive composition of Hayashihara modified by Greer is equivalent to the polymer material of the instant application.

With regard to claim 20, the limitation of "the irradiation is of higher energy than visible light and is selected from ultraviolet light, X-ray, gamma radiation and particle radiation" is merely an intended use and adds no patentable weight to the composition of claim 19.

With regard to claims 22-23, the tetrakis (methylene 3-(3', 5'-di-*t*-butyl-4'-hydroxy-phenyl propionate) methane of Greer, IV is equivalent to the pentaerythritol tetra is (3-(3,5-di-*tert*-butyl-4-hydroxyphenyl)propionate) of the instant application and has a structure equivalent to the compound of formula (A), wherein $n=4$, R_2 and R_4 are *tert*-butyl group, R_3 and R_5 are hydrogen atoms and R_1 is a tetravalent group of 5 carbon atoms which is end-capped with -OCO- groups.

With regard to claim 24, Hayashihara et al. further disclose that the leuco dyes may be fluoran-type dyes (column 4, lines 45-55).

With regard to claim 25, Greer, IV discloses that the phenolic antioxidant is comprised in the radiation-curable composition in an amount of about 0.01wt% to about 7wt%, preferably 0.1wt% to about 1.5 wt% (par.0130)

With regard to claim 26-27, Hayashihara et al. further disclose that the leuco dyes are comprised in the composition in an amount between 7 and 45 wt.% , based on the energy ray curing resin (column 5, lines 1-4). However, Hayashihara et al. further disclose that if the amount of leuco dye is too small, it is impossible to obtain a clear-cut mark and if the dye is used in an excess amount, no further improvement of clearness of the mark formed is provided (column 4, line 65-column 5, line 1).

This shows that the amount of leuco dye in the marking composition of Hayashihara et al. is a result-effective variable and therefore is optimizable.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize

that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result- effective variable.). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05- II Optimization of Ranges)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the amount of leuco dye in the marking composition of modified Hayashihara, in order to obtain a clear-cut mark.

With regard to claims 28-29, Hayashihara et al. further disclose that the composition comprises polyester acrylate oligomers, equivalent to the polyacrylic polymeric material of the instant application.

With regard to claims 30-31, Hayashihara et al. disclose a marking composition comprising an energy ray curing resin and a leuco dye (abstract), equivalent to the color former of the instant application. Hayashihara et al. further disclose that the composition may comprise an antioxidant (column 6, lines 19) but fails to disclose the type of antioxidant used in the marking composition.

Greer, IV discloses a radiation-curable coating composition comprising a dye or dye precursor (abstract), equivalent to the color former of the instant application, resins (oligomers A-E in table in par.0187) and antioxidants which minimize or even inhibit the destruction of the dye and the coating (par.0131). Preferred antioxidants include derivatives of phenol, such as tetrakis (methylene 3-(3', 5'-di-t-butyl-4'-hydroxy-phenyl propionate) methane (par.0143).

The tetrakis (methylene 3-(3', 5'-di-t-butyl-4'-hydroxy-phenyl propionate) methane comprises four phenol moieties, each carrying one bond to a tetravalent alkyl group of 5 carbon atoms which is end-capped with -OCO- groups.

Therefore, it would have been obvious to one of ordinary skill in the art at the time to include a phenolic antioxidant, such as tetrakis (methylene 3-(3', 5'-di-t-butyl-4'-hydroxy-phenyl propionate) methane as disclosed by Greer, IV in the marking composition of Hayashihara et al., in order to minimize or inhibit the destruction of the dye and the coating (Greer, IV, par. 0131).

Hayashihara et al. further disclose that the marking composition is coated on a substrate to be marked, such as a plastic films (column 7, lines 6-23). This step is equivalent to the step of placing the polymer material in the site to be controlled of claim 30 of the instant application.

Hayashihara et al. further disclose that the marking composition can be used for marking the maker's name, contents, date of production, lot number, etc. on the surfaces of the sheets, packaging sheets, cards, labels (column 1, lines 11-20 and column 7, lines 24-29). A label having the above-mentioned marking composition applied thereon is equivalent to the tag having the polymer material comprising components a) and b) in form a film on a surface thereof as required by claim 31 of the instant application.

Hayashihara et al. disclose that the marking composition may be exposed with energy rays, (column 3, lines 32-34) and the developed color density of each exposed test piece is measured after irradiation/exposure (column 9, lines 59-63). This step is equivalent to the step of checking the color of the sample of the instant application.

Hayashihara et al. disclose that the marking compositions lead to clear-cut black marks (column 8, lines 48-49), equivalent to the irreversible color change of the instant application.

With regard to claim 32, the limitation of "the irradiation is from ultraviolet laser or ultraviolet lamp radiation of 285 to 400 nm, electron radiation, X-ray and gamma radiation" is merely an intended use and adds no patentable weight to the composition of claim 20.

Response to Arguments

9. Applicant's arguments filed on October 16, 2008 have been considered but are moot in view of the new grounds of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795